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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/395,993	09/15/1999	ALISON JOAN LENNON	169.1451	6766
5514	7590	03/07/2005	EXAMINER	
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2623

DATE MAILED: 03/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/395,993

Applicant(s)

LENNON, ALISON JOAN

Examiner

Mehrdad Dastouri

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-16,18,20-33,35,37-50,52,54-66,68-80 and 82-96 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-16,18,20-33,35,37-50,52,54-66,68-80 and 82-96 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 29, 2004 has been entered.

Response to Amendment

2. Applicant's amendment filed on June 4, 2004, has been entered and made of record.

Response to Amendment

3. Applicant's arguments regarding Claims 1, 18, 35, 52, 66, 80 and 94 have been fully considered but they are not persuasive.

Applicant argues that prior art of record (Modestino et al) do not disclose, "assigning one of a plurality of predetermined stereotypes to the labeled region adjacency graph (RAG) according to at least one identified predetermined pattern of the semantic labels in the labeled RAG, such that the assigned stereotypes describes the plurality of the digital image (i.e., the entire RAG and the entire digital image)".

The Examiner disagrees and indicates that Modestino et al clearly indicates "In high-level processing, image domain knowledge is used to assign object label to the primitives, thereby providing a semantic description of the image. **The joint**

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assignment of object labels for all the image primitives provides a stereotype interpretation of the image.

This means a stereotype (high-level interpretation) is associated with the image semantic label. Modestino et al teachings clearly disclose this concept (Figures 1(a)-1(c), 5(a)-5(d) and 6(a)-6(d); Tables I-IV; Page 606, Section I, Introduction, Paragraphs 1-3; Pages 610-613, Sections V-VII). Modestino et al disclose a Markov Random Field (MRF) model-based approach image interpretation and classification by performing knowledge-based high-level processing via assigning higher-level expressions (Stereotypes) to the classified objects. The region adjacency graph is classified based on higher-level expression or stereotypes (e.g., rural road scenes comprising road, field, car and sky).

Modestino et al.'s teachings are not limited to "one label to one region". "Two regions" and "three regions" categories depicted in Table I in association of Figures 1(a)-1(c) are stereotype labeling or higher-level expressions.

It is further submitted that the invention outlined in the paragraph connecting Pages 31 and 32, is not recited in the claimed subject matter.

Claim 94 recites "analyzing the labeled RAG by assigning **one** or more of a plurality of stereotypes". Consequently, with consideration of one stereotype, analogous arguments presented for Claims 1, 8, 9 and 14, are applicable to Claim 94.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 3-10, 13-16, 18, 20-27, 30-33, 35, 37-44, 47-50, 52, 54-61, 66, 68-75, 80, 82-89 and 94-96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Modestino et al (IEEE Paper ISBN: 0162-8828; A Markov random Field Model-Based Approach to Image Interpretation) in view of Jain et al (US 6,360,234).

Regarding Claim 1, Modestino et al disclose a method of classifying a digital image, said method comprising the steps of:

segmenting the digital image into a plurality of substantially homogeneous regions (Figure 1; Pages 607-608, Section II-B. The image in Figure 1a is segmented into homogeneous nodes or regions, $R = \{R_1, R_2, \dots, R_n\}$ as depicted in Figure 1(c).);

processing the plurality of regions to provide a region adjacency graph (Figure 1; Section II) for the digital image, the region adjacency graph representing adjacencies between the plurality of regions of the digital image (Figure 1(b);

labeling at least one of the regions of the region adjacency graph with one of a plurality of predetermined semantic labels to provide a labeled region adjacency graph (Figure 1; Page 607, Column 2, Section IIB, first Paragraph. $G = \{R, E\}$ is the region adjacency graph comprising of the set of nodes $R = \{R_1, R_2, \dots, R_N\}$ and the set of edges E connecting the regions. The labels assigned to the segmented regions. $L = \{L_1, L_2, \dots, L_M\}$ is the set of all predetermined semantic labels.);

analyzing the labeled region adjacency graph to identify one or more predetermined patterns of the semantic labels in the labeled region adjacency graph

(Abstract; Figure 1; Pages 608-609, Section III-B. The image in Figure 1a is segmented into homogeneous nodes or regions, $R = \{R_1, R_2, \dots, R_n\}$ as depicted in Figure 1(c).

Section IIIB describes predetermined patterns of the semantic labels; e.g., the second type of clique basis functions for spatial constraints, "a car should be on the road" or "a car should never be in the sky. Predetermined patterns of the semantic labels are identified as shown in Tables I-IV, i.e., possible combinations and impossible combinations.);

assigning one of a plurality of predetermined stereotypes to the labeled region adjacency graph according to at least one identified predetermined pattern of the semantic labels in the labeled region adjacency graph, each of the predetermined stereotypes corresponding to at least one of the predetermined patterns such that the assigned stereotype describes the plurality of regions of the digital image and represents a classification of the digital image (Figures 1, 5(a)-5(d), 6(a)-6(c); Page 606, Introduction; Pages 608-610, Section III-B, Clique Functions for Multiple-Node Cliques; Tables I-IV. The region adjacency graph is classified based on higher-level expression or stereotypes (e.g., "a car should be on (neighboring to) the road" is an example of stereotype to the labeled RAG; also rural road scenes comprising road, field, car and sky. "Two regions" and "three regions" categories depicted in Table I in association of Figures 1(a)-1(c) are components of stereotypes or higher-level expressions. The joint assignment of object labels for all the image primitives provides a stereotype for interpretation of the image. The digital image is classified based on the identified

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patterns (features) of the regions as depicted in Figures 1, 5(a)-5(d), 6(a)-6(c) and Tables I-IV.).

Modestino et al do not explicitly disclose storing the assigned stereotype and the digital image in one or more databases of digital images, wherein the digital image is retrievable from the one or more databases using the assigned stereotypes.

“storing the assigned stereotype (higher-level expressions) and the digital image in databases of digital images to retrieve the digital image from the databases using the assigned stereotypes” is the fundamental concept in “Content-Based Image Retrieval, CBIR” and “Query-Based Image Retrieval, QBIR” well known in the art (Official Notice).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Modestino et al.’s teachings to retrieve the digital image from the databases using the stored stereotypes corresponding to these digital images because it is a well known methodology routinely implemented in Content-Based Image Retrieval and Query-Based Image Retrieval systems wherein complex digital images are retrievable by implementing higher level intelligible contextual information.

Regarding Claim 3, Modestino et al further disclose the method according to Claim 1, wherein identification of the predetermined pattern is based on a size of one or more regions of the digital image (Section III, first paragraph; Section IIIB; Tables I-IV. Classification is based on the areas and the boundary lengths of the regions identified by the RAG nodes.).

Regarding Claim 4, Modestino et al further disclose the method according to Claim 1, wherein identification of the predetermined pattern is based on an adjacency of

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the regions (Figure 1; Pages 608-609, Section III-B; Figures 1 and 6(b). Region adjacency graphs are inherently generated based on the spatial dependence of objects in the relative proximity of each other as depicted in Figure 1(c).).

Regarding Claim 5, Modestino et al further disclose the method according to Claim 1, wherein identification of the predetermined pattern is based on semantic label content of the region adjacency graph (Figure 1; Pages 608-609, Section III).

Regarding Claim 6, Modestino et al further disclose the method according to Claim 1, wherein identification of the predetermined pattern is based on a mean color of one or more regions of the digital image (Figure 1; Pages 608-609, Section III; Page 613, Table III(a), Average Gray Level of the regions).

Regarding Claim 7, Modestino et al. do not disclose the method according to Claim 1, wherein the plurality of stereotypes are stored in an association lookup table.

Jain et al further disclose the method according to Claim 1, wherein the plurality of stereotypes are stored in an association lookup table (Figures 6, 9, 16 and 17; Column 6, Lines 29-47; Column 13, Lines 52-67, Column 14, Lines 1-31).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Modestino et al.'s teachings according to Jain et al. teachings to store the plurality of stereotypes in an association lookup table because it is a well known methodology routinely implemented in the art for information storage and retrieval.

Regarding Claim 8, Jain et al further disclose the method according to Claim 1, wherein the stereotypes are represented in a hierarchal arrangement (Figures 7, 9 and 17; Column 6, Lines 29-47; Column 13, Lines 52-67, Column 14, Lines 1-31).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Modestino et al.'s teachings according to Jain et al. teachings to represent the stereotypes in a hierarchal arrangement because it is a well known methodology routinely implemented in the art for inter-relating image retrieval information.

Regarding Claim 9, arguments analogous to those presented for Claim 8 are applicable to Claim 9.

Regarding Claim 10, Modestino et al disclose the method according to Claim 1, wherein the region adjacency graph is provided by analyzing contextual data associated with one or more regions of the digital image (Abstract; Page 606, Introduction; Figure 1, Page 607-609, Sections IIB and 3, first Paragraph).

Regarding Claim 13, Modestino et al do not disclose the method according to Claim 1, further comprising the step of providing metadata associated with the digital image, wherein the metadata includes the stereotypes of the digital image.

Jain et al disclose a method for video cataloging by providing metadata associated with the image comprising the step of providing metadata associated with the digital image, wherein the metadata includes the stereotypes of the digital image (Figures 16 and 17; Column 13, Lines 52-67, Column 14, Lines 1-31).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Modestino et al invention according to the teachings of Jain et al to provide metadata associated with the digital image, wherein the metadata includes the stereotypes of the digital image because it will improve image appearance and enhance image classification. It will accurately classify and intelligently extract information, termed metadata, about the contents of video stream in real time (Jain et al, Column 1, Lines 46-49)

Regarding Claim 14, Jain et al further disclose the method according to Claim 13, wherein the metadata includes a hierarchical path associated with the respective stereotype of each digital image (Figures 9, 15-17; Table 1; Column 8, Lines 22-61).

Regarding Claim 15, Jain et al further disclose the method according to Claim 14, wherein the hierarchical path is stored with a respective stereotype as a metadata object which is associated with a respective image object (Figure 6; Column 6, Lines 29-38).

Regarding Claim 16, Jain et al further disclose the method according to Claim 14, wherein the hierarchical path is stored as a referenced lookup table (Figure 7).

With regards to Claims 18, 35, 52, 66 and 80, arguments analogous to those presented for Claim 1 are applicable to Claims 18, 35, 52, 66 and 80.

Concerning Claims 52, 66 and 80, Modestino et al further disclose providing a set of labeled regions (Abstract Lines 5-10; Page 607, Column 2, Section IIB, second paragraph, set of labels $L = \{L_1, L_2, \dots, L_M\}$). Markov Random Field (MRF) model-based approach segments the image into a collection of disjoint regions that form the nodes of

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an adjacency graph. Once the adjacency graph has been determined, image classification will be achieved through assigning object labels to the segmented regions using domain knowledge, extracted feature measurements, and spatial relationship between the various regions (Abstract, Lines 5-10).

With regards to Claims 20, 37, 56, 70 and 84, arguments analogous to those presented for Claim 3 are applicable to Claims 20, 37, 56, 70 and 84.

With regards to Claims 21, 38, 55, 69 and 83, arguments analogous to those presented for Claim 4 are applicable to Claims 21, 38, 55, 69 and 83.

With regards to Claims 22, 39, 54, 68 and 82, arguments analogous to those presented for Claim 5 are applicable to Claims 22, 39, 54, 68 and 82.

With regards to Claims 23, 40, 57, 58, 71, 72, 85 and 86, arguments analogous to those presented for Claim 6 are applicable to Claims 23, 40, 57, 58, 71, 72, 85 and 86.

With regards to Claims 24, 41, 59, 73 and 87, arguments analogous to those presented for Claim 7 are applicable to Claims 24, 41, 59, 73 and 87.

With regards to Claims 25, 42, 60, 74 and 88, arguments analogous to those presented for Claim 8 are applicable to Claims 25, 42, 60, 74 and 88.

With regards to Claims 26, 43, 61, 75 and 89, arguments analogous to those presented for Claim 9 are applicable to Claims 26, 43, 61, 75 and 89.

With regards to Claims 27 and 44, arguments analogous to those presented for Claim 10 are applicable to Claims 27 and 44.

Regarding Claim 30, Modestino et al do not disclose the method according to Claim 18 further comprising the step of providing metadata associated with the digital image, wherein the metadata includes the stereotypes of the digital image.

Jain et al disclose a method for video cataloging by providing metadata associated with the digital image, wherein the metadata includes stereotypes of the digital image (Figures 16 and 17; Column 13, Lines 52-67, Column 14, Lines 1-31).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Modestino et al invention according to the teachings of Jain et al to provide metadata associated with the digital image, wherein the metadata includes stereotypes of the digital image because it will accurately classify and intelligently extract information, termed metadata, about the contents of video stream in real time (Jain et al, Column 1, Lines 46-49).

With regards to Claim 31, arguments analogous to those presented for Claim 14 are applicable to Claim 31.

With regards to Claim 32, arguments analogous to those presented for Claim 15 are applicable to Claim 32.

With regards to Claim 33, arguments analogous to those presented for Claim 16 are applicable to Claim 33.

With regards to Claim 47, arguments analogous to those presented for Claim 13 are applicable to Claim 47.

With regards to Claim 48, arguments analogous to those presented for Claim 14 are applicable to Claim 48.

With regards to Claim 49, arguments analogous to those presented for Claim 15 are applicable to Claim 49.

With regards to Claim 50, arguments analogous to those presented for Claim 16 are applicable to Claim 50.

With regards to Claim 94-96, arguments analogous to those presented for Claims 1, 8, 9 and 14 are applicable to Claims 94-96.

6. Claims 11, 12, 28, 29, 45, 46, 62-65, 76-79 and 90-93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Modestino et al further in view of Jain et al (US 6,360,234) and Li et al (U.S. 5,930,783).

Regarding Claim 11, Modestino et al and Jain et al do not explicitly disclose the method according to Claim 10, wherein the contextual data comprises information generated by one or more separate sources of the information.

Li et al disclose a semantic and cognition based image retrieval methodology comprising analyzing contextual data generated by one or more separate sources of information (Figure 1B, Semantic-based Query, Cognition-based Query; Column 12, Lines 30-40).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Modestino et al and Jain et al combination according to the teachings of Li et al to analyze contextual data generated by one or more separate sources of information because it will expand versatility of the image segmentation and classification. It will utilize the advantages of image retrieval based on both image semantics and visual examples of the image (Li et al, Column 3, Lines 27-35).

With regards to Claims 28 and 45, arguments analogous to those presented for Claim 11 are applicable to Claims 28 and 45.

With regards to Claims 63, 77 and 91, arguments analogous to those presented for the corresponding portion in Claim 1 are applicable to Claims 63, 77 and 91. Li et al retrieve the digital image by using a keyword representing a stereotype (Column 12, Lines 30-50).

With regards to Claims 64, 78 and 92, arguments analogous to those presented for the corresponding portion in Claim 1 are applicable to Claims 64, 78 and 92. Modestino et al, Jain et al and Li et al do not explicitly retrieve the digital image by using an icon to represent a stereotype. Utilizing an icon to represent a keyword is extremely well known in the art (Official Notice).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Modestino et al, Jain et al and Li et al combination to Utilize an icon for representing a keyword because icons are a significant factor in the user- friendliness of graphical user interface that serve as visual mnemonics to allow the user to control certain computer actions without having to remember commands or type them at the keyboard.

With regards to Claims 62, 76 and 90, arguments analogous to those represented for Claim 64 concerning utilizing an icon is applicable to claims 62, 76 and 90.

With regards to Claims 65, 79 and 93, arguments analogous to those presented for corresponding portion of Claim 1 are applicable to Claims 65, 79 and 93. Li et al retrieve the digital image by using a keyword representing a generalization of a stereotype (Column 12, Lines 30-50).

Regarding Claim 12, neither Modestino et al nor Li et al disclose the method according to Claim 11, wherein a corresponding portion of said contextual data is obtained from a temporal region of interest for each source of said information.

Jain et al disclose a method for video cataloging by providing metadata associated with the image wherein a corresponding portion of contextual data is obtained from a temporal region of interest for each source of information (Figures 6-9; Column 6, Lines 30-67).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Modestino et al and Li et al combination according to the teachings of Jain et al to obtain a corresponding portion of the contextual data from a temporal region of interest for each source of information because it will accurately classify and intelligently extract information, termed metadata, about the contents of video stream in real time (Jain et al, Column 1, Lines 46-49).

With regards to Claims 29 and 46, arguments analogous to those presented for Claim 12 are applicable to Claims 29 and 46.

Contact Information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mehrdad Dastouri whose telephone number is (703)

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305-2438. The examiner can normally be reached on Monday to Friday from 8:00 a.m. to 4:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703) 308-6604.

The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular and for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center Customer Service Office whose telephone number is (703) 306-0377.

Mehrdad Dastouri
Primary Examiner
Group Art Unit 2623
March 6, 2005

MEHRDAD DASTOURI
PRIMARY EXAMINER

Mehrdad Dastouri